

Sustainable Training Quality for Labor Export to Japan: A Socio-Economic Perspective in the Era of Digital Transformation and Artificial Intelligence

Nguyen Thanh Huyen¹, Ha Thi Thu Phuong², Vu Si Doan³, Nguyen Thi Phuong Thao⁴, Nguyen Van Hau⁵

¹University of Labour and Social Affairs, Hanoi, Vietnam; Email: E-mail: huyennt@ulsa.edu.vn; Orcid: <https://orcid.org/0009-0004-0624-9859>

²(Corresponding Author), Hanoi University of Business and Technology, Vietnam; 124 Vinh Tuy road, Hanoi city, Vietnam; Email: haphuongtc96@gmail.com; Orcid: <https://orcid.org/0009-0007-8541-557X>;

³Electric Power University, Hanoi, Vietnam; Email: doanvs@epu.edu.vn; <https://orcid.org/0009-0000-9902-8908>

⁴Banking Academy of Vietnam, Hanoi, Vietnam; Email: thaontp@hvn.edu.vn; Orcid: <https://orcid.org/0009-0004-6755-9121>.

⁵Posts and Telecommunications Institute of Technology, Hanoi, Vietnam; Email: haunv@ptit.edu.vn; Orcid: 0000-0003-2613-7753

HOW TO CITE:

Nguyen Thanh Huyen, Ha Thi Thu Phuong, Vu Si Doan, Nguyen Thi Phuong Thao, Nguyen Van Hau (2026). Sustainable Training Quality for Labor Export to Japan: A Socio-Economic Perspective in the Era of Digital Transformation and Artificial Intelligence. International Journal of Special Education, 41(7s), 1423-1433

COPYRIGHT STATEMENT:

Copyright: © 2026 Authors.
Open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

ABSTRACT:

This study examines the overall training quality outcome (TQO) provided by firms for Vietnamese workers entering the Japanese labor market in the context of digital transformation and artificial intelligence (AI). Drawing on human capital theory, economic sociology, and institutional theory, the research conceptualizes training quality as a multidimensional construct encompassing occupational competence, job readiness, discipline, and adaptability to technology-enabled environments. A quantitative research design was employed, with data collected from 360 respondents, including trainees and stakeholders involved in labor export training programs. Reliability analysis and exploratory factor analysis confirm the validity of the measurement scale, while group comparison techniques (T-test and ANOVA) reveal no significant differences in perceived training outcomes across gender, job position, and seniority groups. The findings indicate that training programs achieve moderate effectiveness but require further improvement to meet the stringent requirements of the Japanese labor market. Importantly, the study highlights the growing importance of digital skills and AI adaptability as key components of workforce readiness. The results contribute to the literature by integrating socio-economic and technological perspectives into the analysis of training quality and offer practical implications for firms and policymakers aiming to promote sustainable labor export.

Keywords: training quality, education, socio-economics, Japanese labor market, artificial intelligence (AI)

JEL Classifications: O15, M12, M54, K31, A13, A14

I. Introduction

The international labor market has undergone significant transformation in recent decades,

particularly in the context of globalization and demographic changes in developed economies. Among destination countries, Japan has become

a major labor importer due to its aging population and labor shortages. For Vietnam, labor export plays a crucial role in socio-economic development by improving income, reducing unemployment, and enhancing human capital.

From a socio-economic perspective, labor export is not merely an economic activity but also a socially embedded process shaped by institutional frameworks, cultural expectations, and workforce characteristics. Workers' ability to integrate into foreign labor markets depends not only on technical skills but also on discipline, adaptability, and social norms. These aspects are particularly relevant in Japan, where work ethics and organizational culture are highly valued.

In the current context, digital transformation and artificial intelligence (AI) are reshaping workforce training and labor mobility. Digital platforms facilitate recruitment and training processes, while AI-based systems support skill matching and performance evaluation. However, these technological developments also increase the requirements for training quality, as workers must adapt to more complex and technology-driven work environments.

Empirically, the Japanese labor market imposes strict requirements on foreign workers, including age limits, health conditions, and discipline standards. These requirements place significant pressure on training institutions and firms to ensure that workers meet both technical and behavioral expectations.

Therefore, this study aims to evaluate the overall training quality outcome (TQO) provided by firms for the Japanese labor market. By examining training effectiveness and workforce readiness, the study contributes to understanding sustainable labor export in the era of digital transformation.

II. Background theory and literature review

A. Literature review

Recent studies on international labor migration emphasize that labor mobility is increasingly shaped by both demographic pressures in destination countries and skill-readiness conditions in origin countries. The OECD (2024)

report on Japan shows that Japan continues to rely heavily on foreign workers, including technical interns and temporary labor migrants, to address labor shortages caused by population aging and sectoral workforce gaps. This creates significant opportunities for Vietnamese workers, but also raises the required standards for training quality, discipline, language ability, and workplace adaptability.

The Asian Development Bank (2024), ADBI, and OECD highlight that skills certification, sector-specific training, and seasonal labor mobility have become important issues in Asian labor migration. Their findings suggest that successful migration is not determined only by labor supply, but also by the compatibility between workers' skills and the receiving country's institutional and occupational requirements. This is directly relevant to Vietnam's labor export to Japan, where firms must ensure that trainees meet technical, cultural, and behavioral standards before departure.

The OECD (2023) employment outlook focuses on the impact of artificial intelligence on labor markets and argues that AI is reshaping job tasks, skills demand, and workplace organization. Although the report is not specific to labor export, it provides an important foundation for understanding why training quality should now include digital literacy, adaptability to AI-supported work systems, and lifelong learning. This implies that training programs for the Japanese market should move beyond traditional occupational training and integrate digital readiness into their outcome assessment.

Recent research on the digital economy and labor migration also shows that digital development affects workers' migration decisions and labor market mobility. Yu et al. (2024) finds that the urban digital economy influences regional labor migration behavior by changing job opportunities, information access, and workers' location decisions. This finding suggests that digital transformation not only affects destination labor markets but also shapes the preparation, recruitment, and training processes in origin countries such as Vietnam.

The FY (2023) technical intern trainees follow-up survey in Japan provides practical evidence on the importance of post-training outcomes, including employment status and the use of skills and knowledge acquired through training. This supports the view that training quality should be evaluated not only by course completion but also by whether trainees can apply acquired competencies in real work settings. For Vietnamese firms providing training for Japan-bound workers, this reinforces the need to assess TQO as a multidimensional construct involving occupational competence, workplace readiness, discipline, and technology adaptability.

Overall training quality outcome (TQO) is defined as the extent to which training programs enable trainees to achieve required competencies, adapt to digital work environments, and meet both technical and behavioral standards of the destination labor market. In the context of digital transformation and AI, TQO also reflects the effectiveness of training in developing digital literacy, technology adaptability, and the ability to interact with AI-enabled systems.

Although prior studies and institutional reports have examined labor migration, skills certification, AI-driven labor-market change, and Japan's demand for foreign workers, limited empirical research has focused specifically on the overall training quality outcome provided by Vietnamese firms for the Japanese labor market. Existing studies often emphasize migration flows, policy frameworks, or employment outcomes, but pay less attention to how training outcomes are measured from the perspectives of trainees and stakeholders. In addition, the integration of digital and AI-related competencies into training quality assessment remains underdeveloped. Therefore, this study addresses this gap by examining TQO as a unified construct reflecting occupational competence, job readiness, competency improvement, and adaptation to the evolving Japanese labor market.

Building upon the results of previous studies, we developed scales to measure overall training quality outcome (TQO) provided by firms for the Japanese labor market (see table 1).

Table 1: Measurement scales of dependent variables

Code	Description	Sources
Overall training quality outcome (TQO)		
TQO1	The training program enables trainees to achieve the required occupational and digital competencies.	Adapted from expert interviews and OECD (2021), authors' development based on expert opinion, adapted from ILO (2022) and authors' proposal.
TQO2	After training, trainees are able to meet workplace requirements in Japan, including technology-enabled working environments.	
TQO3	Training outcomes demonstrate clear improvement in trainees' professional, digital, and problem-solving competencies.	
TQO4	Overall training quality effectively supports trainees' readiness for modern and AI-supported workplaces.	

The measurement scale for training quality outcomes (TQO) was revised to reflect the evolving competency requirements of the Japanese labor market in the context of digital transformation and artificial intelligence (AI). In addition to traditional indicators of occupational competency and job readiness, the revised scale incorporates trainees' digital adaptability,

problem-solving capability, and readiness for technology-enabled workplaces. This adjustment aligns with recent developments in vocational education and workforce training, where digital competencies and AI-related operational skills are increasingly considered critical dimensions of training effectiveness.

B. Background theory

Human Capital Theory

Human capital theory argues that education, training, skills, and work experience increase individuals' productivity and economic value. From this perspective, training is an investment that enhances workers' employability, income potential, and adaptability in the labor market. For international labor migration, human capital is particularly important because workers must meet the skill expectations of employers in destination countries.

In this study, human capital theory explains why training quality outcomes matter for Vietnamese workers entering the Japanese labor market. Training programs should not only provide technical knowledge but also improve occupational competence, workplace discipline, communication ability, and readiness for digitalized work environments. In the context of AI and automation, human capital increasingly includes digital literacy and the ability to work with technology-enabled systems.

Economic Sociology and Embeddedness Theory

Economic sociology emphasizes that economic behavior is embedded in social relationships, institutions, norms, and cultural expectations. Labor export is therefore not only an economic transaction but also a social process shaped by family expectations, recruitment networks, training institutions, destination-country culture, and regulatory systems. Workers' success abroad depends on both skills and social adaptation.

Applied to this study, economic sociology helps explain why training quality for the Japanese labor market must include behavioral and cultural dimensions. Japan's workplace environment places strong emphasis on discipline, punctuality, teamwork, responsibility, and compliance with rules. Therefore, TQO should be understood as the combined outcome of technical training, behavioral preparation, cultural orientation, and institutional readiness.

Institutional Theory

Institutional theory suggests that organizations operate under pressures from laws, regulations,

norms, and professional standards. In labor export, training firms must respond to requirements imposed by both the sending country and the receiving country. These include legal recruitment procedures, health requirements, age standards, language expectations, and workplace conduct rules.

In this study, institutional theory explains why firms providing training for the Japanese market must align training content with strict external requirements. The Japanese labor market often requires workers to be healthy, disciplined, relatively young, and prepared for standardized workplace practices. Therefore, training quality is shaped not only by internal firm capacity but also by regulatory expectations, employer demands, and the institutional standards of Japan's labor system.

Digital Transformation Theory

Digital transformation theory explains how digital technologies change organizational processes, competencies, and value creation. In labor training, digital platforms, online learning systems, data analytics, and AI-based tools can improve recruitment, learning management, skill assessment, and trainee monitoring. These technologies may enhance training efficiency but also require trainees and trainers to develop new digital capabilities (OECD, 2023).

In this study, digital transformation theory supports the extension of TQO beyond traditional training outcomes. Training quality should include trainees' ability to use digital tools, adapt to technology-enabled workplaces, and interact with AI-assisted systems. This is increasingly important because destination labor markets are becoming more digitalized, and workers who lack digital readiness may face adaptation difficulties after migration.

III. Research methodology

This study adopts a quantitative research design to evaluate the overall training quality outcome provided by firms for the Japanese labor market. Data were collected from 360 respondents, including trainees and stakeholders involved in training programs for Japan-bound workers. The

sample structure covers gender, job position, and seniority groups, allowing the study to compare perceptions of training quality across different respondent characteristics. This design is appropriate because the study aims to measure perceived training outcomes and examine whether these perceptions differ across groups.

The measurement scale for TQO was developed based on expert opinions and the practical requirements of the Japanese labor market. The original scale includes four indicators: achievement of occupational competencies, ability to meet job requirements in Japan, improvement in trainee competencies, and overall fulfillment of training objectives. To strengthen the study's relevance in the current context, the authors may extend the scale by adding digital and AI-related items, such as digital skills, adaptability to technology-enabled workplaces, and readiness to interact with AI-supported systems. This adjustment would make TQO more consistent with the realities of digital transformation and sustainable labor export.

The data analysis follows a structured process using SPSS. First, descriptive statistics are used to summarize respondent characteristics and

evaluate the average level of perceived TQO. Second, Cronbach's alpha is applied to assess the internal consistency of the measurement scale. Third, exploratory factor analysis (EFA) is conducted to examine construct validity and determine whether TQO can be represented as a unified latent factor. These techniques correspond directly to Sections IV.A, IV. B, and IV.C of the empirical results.

To examine group differences, the study applies independent-samples T-tests and one-way ANOVA. The T-test is used to compare perceived TQO between male and female respondents and between trainees and stakeholders, corresponding to Sections IV. D, and IV.E. One-way ANOVA is used to test whether TQO differs across seniority groups, corresponding to Section IV. F. These methods are suitable because they help determine whether training quality outcomes are consistently perceived across demographic and occupational groups, thereby providing evidence on the inclusiveness and stability of training programs for the Japanese labor market.

Table 2 presents the research sample information.

Table 2: Survey subjects

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender					
Valid	Male	237	65.8	65.8	65.8
	Female	123	34.2	34.2	100.0
Job position					
Valid	Stakeholders	169	46.9	46.9	46.9
	Trainees	191	53.1	53.1	100.0
Seniority					
Valid	5 years or higher	67	18.6	18.6	18.6
	From 2 to less 5 years	77	21.4	21.4	40.0
	Less 2 years	216	60.0	60.0	100.0
Total		360	100.0	100.0	

Source: Prepared by the authors (2025) and SPSS software.

IV. Results and discussion

A. Descriptive statistics

Table 3 presents descriptive statistics of the observed variables measuring overall training quality outcome among surveys.

Table 3: Results of respondents' survey on overall training quality outcome (TQO)

	N	Minimum	Maximum	Mean	Std. Deviation
TQO1	360	1.0	5.0	3.075	.7951
TQO2	360	1.0	5.0	3.094	.6938
TQO3	360	1.0	5.0	3.206	.8224
TQO4	360	1.0	5.0	3.064	.7891
Valid N (listwise)	360				

Source: Prepared by the authors (2025) and SPSS software.

The descriptive statistics in Table 3 indicate that all observed variables measuring training quality outcomes have mean values slightly above the midpoint (around 3.0–3.2). This suggests that respondents perceive training programs as moderately effective but not yet at a high-performance level. The relatively small standard deviations indicate consistency in responses, reflecting a shared perception among trainees and stakeholders.

From an economic perspective, this implies that training programs in Vietnam have achieved a basic level of effectiveness but still require improvement to meet the increasingly stringent demands of the Japanese labor market. In particular, the moderate scores highlight the need

to enhance both technical competencies and behavioral attributes such as discipline and adaptability.

In addition to traditional training outcomes, the inclusion of digital and AI-related indicators highlights the importance of technological readiness. This suggests that training programs are gradually shifting from purely technical skill development toward a more integrated approach that includes digital competencies.

B. Analysis of the reliability of observed variables

Table 4 presents the results of reliability analysis using Cronbach's Alpha.

Table 4: Results of reliability analysis of observed variables through Cronbach's alpha coefficient

Cronbach's Alpha	N of Items			
0.871	4			
Code	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TQO1	9.364	3.993	.733	.831
TQO2	9.344	4.327	.744	.830
TQO3	9.233	3.940	.716	.839
TQO4	9.375	4.062	.713	.839

Source: Prepared by the authors (2025) and SPSS software.

The reliability analysis results show a Cronbach's alpha of 0.871, indicating strong internal consistency among the measurement items. All corrected item-total correlations exceed acceptable thresholds, confirming that each indicator contributes meaningfully to the overall

construct of training quality outcome (Hair et al., 2009; 2014). This finding suggests that the measurement scale is robust and reliable for assessing training effectiveness. From a policy perspective, the reliability of these indicators allows training institutions and firms to use them

as a basis for evaluating and improving training programs.

C. Analysis EFA

EFA analysis was performed using the component analysis method and Varimax rotation; the analysis results are shown in Table 5.

Table 5: EFA analysis results

STT	Detailed description		Value
1	KMO		0.800
2	Bartlett's test	Chi-Square	720.848
		Df	6
		Sig.	0.000<0.001
3	Total Variance Explained	Number of forming factors	1
		Eigenvalue	2.895
		Total % of extracted variance	72.380
4	Rotation matrix	TQO2	.861
		TQO1	.855
		TQO3	.846
		TQO4	.840

Source: Prepared by the authors (2025) and SPSS software.

The EFA results demonstrate a KMO value of 0.800 and a significant Bartlett's test ($p < 0.001$), confirming the suitability of the data for factor analysis. The extracted factor explains 72.380% of total variance, indicating strong explanatory power (Hair et al., 2009; 2014). This suggests that training quality outcome can be effectively represented as a unified construct. In the context of labor export, this reflects the integrated nature

of training programs, where technical skills, job readiness, and overall competency improvement are closely interconnected.

D. Independent T-test: Genders

Table 6 examines gender differences in the overall training quality outcome (TQO) provided by firms for the Japanese labor market.

Table 6. Differences in the overall training quality outcome (TQO) provided by firms for the Japanese labor market with participants of different genders-Independent Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
TQO	Equal variances assumed	.096	.757	.968	358	.333	.07096	.07327	-.07314	.21505
	Equal variances not assumed			.954	236.916	.341	.07096	.07440	-.07561	.21752

Source: Prepared by the authors (2025) and SPSS software.

The independent T-test results show no statistically significant differences in training quality outcomes between male and female participants ($p > 0.05$). This indicates that training programs are equally effective across genders (Hair et al., 2009; 2014).

From a socio-economic perspective, this finding reflects increasing gender equality in access to

training and labor export opportunities. It also suggests that training programs are inclusive and not biased toward specific demographic groups.

E. Independent T-test: job position

Table 7 examines job position differences (stakeholders and trainees) in the overall training quality outcome (TQO) provided by firms for the Japanese labor market.

Table 7. Differences in the overall training quality outcome (TQO) provided by firms for the Japanese labor market with participants of different job position -Independent Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
TQO	Equal variances assumed	.074	.786	.968	358	.334	.06740	.06963	-.06954	.20433
	Equal variances not assumed			.967	351.178	.334	.06740	.06970	-.06969	.20448

Source: Prepared by the authors (2025) and SPSS software.

The results indicate no significant differences between trainees and stakeholders regarding perceptions of training quality ($p > 0.05$). This suggests alignment between training providers and participants (Hair et al., 2009; 2014).

This alignment is important because it indicates that training programs are meeting expectations from both supply and demand sides. In the

context of sustainable labor export, such consistency enhances program credibility and effectiveness.

F. Oneway Anova

Table 8 and table 9 examine age seniority (5 years or higher, from 2 to less 5 years, and less 2 years) in the overall training quality outcome (TQO) provided by firms for the Japanese labor market.

Table 8: Test of Homogeneity of Variances

Overall training quality outcome

Levene Statistic	df1	df2	Sig.
.090	2	357	.914

Source: Prepared by the authors (2025) and SPSS software.

Table 9: ANOVA

Overall training quality outcome

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.514	2	.257	.590	.555
Within Groups	155.527	357	.436		
Total	156.041	359			

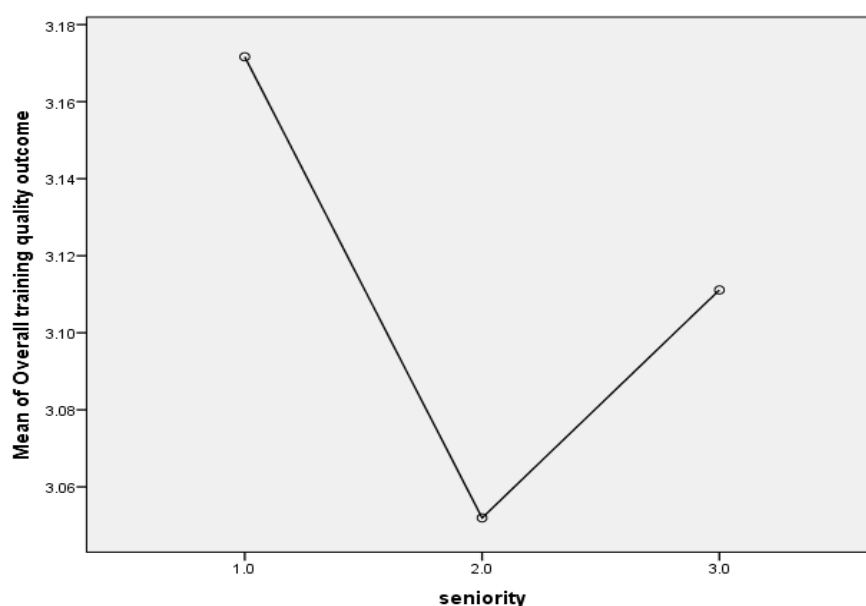
Source: Prepared by the authors (2025) and SPSS software.

The ANOVA results show no statistically significant differences in training quality outcomes across seniority groups ($p > 0.05$). This suggests that experience level does not significantly influence perceptions of training effectiveness (Hair et al., 2009; 2014).

This finding implies that training programs are standardized and accessible to workers with different experience levels. However, it may also

indicate a lack of differentiation in training design, which could limit effectiveness for specific groups.

Figure 1 illustrates the mean values of training quality outcomes across different seniority groups. The figure provides a visual comparison of how perceived training effectiveness varies with experience.

**Figure 1: Mean of TQO by age**

The figure shows relatively similar mean values across all groups, confirming the ANOVA results. This suggests that training programs deliver consistent outcomes regardless of experience level.

From a practical perspective, this consistency indicates stability in training delivery. However, it

also highlights the need for more tailored training approaches to better address the specific needs of different worker groups.

G. Discussion

Recent OECD and ILO reports emphasize that digital competencies, AI adaptability, and lifelong learning are becoming essential requirements for

workforce readiness in modern labor markets (OECD, 2021; ILO, 2022).

The findings of this study are consistent with previous research on workforce training and labor mobility, which emphasizes the importance of human capital development in international labor markets (Becker, 1993). Similar to global studies, training effectiveness is found to be a key determinant of labor market readiness.

However, this study extends the literature by focusing on the Japanese labor market, where discipline and behavioral standards are particularly important. Unlike many Western labor markets, Japan places strong emphasis on work ethics, punctuality, and organizational commitment.

Furthermore, the results highlight the role of digital transformation in shaping training quality. While previous studies mainly focus on technical training, this research suggests that digital tools and AI can enhance training efficiency but also increase performance expectations.

Overall, the findings contribute to the literature by integrating socio-economic, institutional, and technological perspectives into the analysis of training quality for labor export.

The findings suggest that training quality must be redefined in the digital era. Beyond technical competencies, digital literacy and AI adaptability are becoming critical components of workforce readiness. This aligns with global trends where labor markets increasingly demand workers who can operate in technology-enabled environments.

V. Implications and recommendations

First, the findings suggest that training institutions and firms should redesign training programs to align more closely with the evolving requirements of the Japanese labor market. Beyond technical skill development, training should incorporate discipline, work ethics, and cultural adaptability, which are critical for successful integration into Japanese workplaces. In particular, standardized behavioral training modules should be embedded into the training curriculum to ensure that trainees meet employer expectations.

Second, the results highlight the importance of integrating digital transformation into training processes. Firms should invest in digital learning platforms, simulation-based training, and AI-supported assessment tools to improve training efficiency and effectiveness. Enhancing trainees' digital literacy and their ability to work in technology-enabled environments is essential, as many industries in Japan are increasingly adopting automation and digital systems.

Third, policymakers should strengthen the institutional framework for sustainable labor export by establishing clear standards for training quality and monitoring outcomes. This includes developing national guidelines for training evaluation, supporting collaboration between training institutions and foreign employers, and ensuring that training programs are aligned with international standards. Public policies should also encourage the adoption of digital technologies in workforce training.

Finally, the study implies that firms should adopt a more comprehensive approach to evaluating training outcomes. Instead of focusing solely on course completion or certification, training effectiveness should be assessed based on trainees' ability to perform in real work environments, adapt to technological changes, and maintain long-term employment. This approach will enhance the sustainability of labor export and improve the reputation of Vietnamese workers in the Japanese labor market.

VI. Conclusion

This study examines the overall training quality outcome (TQO) provided by firms for Vietnamese workers entering the Japanese labor market. The findings indicate that training programs have achieved moderate effectiveness, with relatively consistent perceptions across different demographic groups. The results also highlight that training quality should be understood as a multidimensional construct, encompassing occupational competence, job readiness, discipline, and adaptability. In the context of digital transformation, training outcomes must extend beyond traditional skill development to include digital literacy and the

ability to operate in technology-enabled environments.

However, the study has several limitations. First, the research relies on cross-sectional survey data, which may not fully capture changes in training outcomes over time. Second, the measurement of TQO focuses primarily on perceived outcomes rather than actual job performance in Japan. Third, digital and AI-related variables are not explicitly modeled as independent factors influencing training quality. Future research should address these limitations by employing longitudinal data, incorporating objective performance indicators, and developing more comprehensive models that integrate digital transformation, AI adoption, and institutional factors into the analysis of sustainable labor export.

References

- Asian Development Bank (2024). <https://www.adb.org/sites/default/files/publication/969876/labor-migration-asia-trends-skills-certification-and-seasonal-work.pdf?>
- Becker, G. S. (1993). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education* (3rd ed.). Chicago: University of Chicago Press. <http://dx.doi.org/10.7208/chicago/9780226041223.001.0001>
- FY (2023). https://www.otit.go.jp/upload/docs/231020_02.pdf?
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate Data Analysis* (7th ed.). Upper Saddle River, NJ: Prentice Hall International.
- Hair, J. F., Henseler, J., Dijkstra, T., Sarstedt, M., Ringle, C., Diamantopoulos, A., Straub, D., Ketchen, D., GTM, H., & Calantone, R. (2014). Common beliefs and reality about partial least squares: comments on Rönkkö and Evermann. *Organizational Research Methods*, 17(2), 182-209.
- International Labour Organization (ILO). (2022). Skills for artificial intelligence and digitalization. International Labour Organization. <https://www.ilo.org/topics-and-sectors/skills-and-lifelong-learning/skills-artificial-intelligence-and-digitalization>
- Organisation for Economic Co-operation and Development (OECD). (2021). OECD skills outlook 2021: Learning for life. OECD Publishing. <https://doi.org/10.1787/0ae365b4-en>
- OECD (2023). https://www.oecd.org/en/publications/oecd-employment-outlook-2023_08785bba-en.html?
- OECD (2024). https://www.oecd.org/en/publications/recruiting-immigrant-workers-japan-2024_0e5a10e3-en/full-report/component-5.html?
- Yu, L., Wang, J., Lou, S., & Wei, X. (2024). To leave or to stay: Digital economy development and migrant workers' location choice. *Journal of Asian Economics*, 94, Article 101792. <https://www.sciencedirect.com/science/article/abs/pii/S1049007824000873?>

Acknowledgement:

The authors would like to thank the University of Labour and Social Affairs, Vietnam; Hanoi University of Business and Technology, Vietnam; Banking Academy of Vietnam, Hanoi, Vietnam; Electric Power University, Hanoi, Vietnam; Posts and Telecommunications Institute of Technology, Hanoi, Vietnam; and other researchers and reviewers who helped us during the study period.

Confirm originality of work:

We confirm the originality of your paper and ensure it is free of plagiarism or accidental uncredited work.

Conflicts of interest:

No conflicts of interest are disclosed by the writers.